

Macmillan and Co. will issue in a few days, has had to introduce many modifications of the original text, and make many additions. Especially is this the case in the first part of the work dealing with the classification and genesis of ore deposits. This has been entirely rewritten in order to bring it into accordance with modern ideas. The second part of the work, being mainly a record of facts and observations on ore deposits of the principal mining regions, has not needed to be recast, though the results of recent studies, and of newly-developed fields and deposits have been added. The work has thus been rejuvenated, and will continue to hold its high place among mining literature. Another new edition to be published by Messrs. Macmillan in a few days, is Ziegler's "Special Pathological Anatomy." The first English edition of this standard work was published in 1884, but the edition (the third) shortly to be issued differs from it very considerably, having been translated from the eighth German edition. So great have been the advances in pathological anatomy during the past twelve years, that the text has had to be completely rewritten. The forthcoming volume has been translated and edited by Dr. Donald MacAlister and Dr. Henry W. Cattell. The second volume of the work is in the press, and it will be followed by a new version of the part on general pathological anatomy.

THE researches of Émil Fischer on the action of phenylhydrazine on the various sugars have shown that either a simple hydrazone is formed, by the reaction of the aldehyde or ketone group of the sugar with the amido-group of the hydrazine, or that, in addition to this, the hydrogen atoms, combined with the carbon atom adjacent to the carbonyl group, are removed, and a second molecule of phenylhydrazine enters into reaction, an osazone being formed. In a paper published in the current number of the *Berichte*, E. Davidis describes two new types of hydrazine derivatives of the sugars, which have been obtained in the laboratory of Prof. Curtius. When a sugar such as glucose is warmed with hydrazine hydrate and a little methyl alcohol, two molecules of the sugar react with one of the hydrazine, and glucosaldazine, $C_6H_{10}O_5:N:N:C_6H_{12}O_5$, is produced. Similar compounds are formed by fructose and arabinose, and they are all readily hydrolysed by dilute acids. Compounds of the second type are formed when the sugar is treated with an acid hydrazide, such as benzhydrazide, $C_6H_5.CO.NH.NH_2$, in the presence of dilute alkalis. Under these circumstances, no less than *four* molecules of the hydrazide react with one molecule of the sugar. The compound produced from glucose, which the author terms glucosebenzosazone, therefore resembles glucosazone in constitution, but differs from it inasmuch as the removal of the hydrogen atoms and reaction with the hydrazide has been extended to three consecutive carbon atoms. A portion of the benzhydrazide is simultaneously decomposed with formation of ammonia and benzoic acid. Lævulose yields precisely the same compound as glucose. It has, so far, been found impossible to prepare a benzosazone containing either more or less than four hydrazine groups. These compounds crystallise well, and melt at a comparatively high temperature; and it is therefore possible that they may play an important part in the investigation of the very complicated group of compounds to which the sugars belong.

THE additions to the Zoological Society's Gardens during the past week include a Mozambique Monkey (*Cercopithecus pygerythrus*, ♂) from South-east Africa, presented by Dr. John Archibald; a Hocheur Monkey (*Cercopithecus nictitans*, ♂) from Congoland, presented by the Rev. Lawson Forfeitt; a Syrian Bear (*Ursus syriacus*, ♀) from Western Asia, presented by Mr. G. A. Schenley; a Garden Dormouse (*Myoxus quercinus*), European, presented by Mr. W. H. St. Quintin; two White Storks (*Ciconia alba*), European, presented by Miss Agnes

Woodroffe; a Black-backed Piping Crow (*Gymnorhina tibicen*) from Australia, presented by Mr. Charles G. Murrell; four European Tree Frogs (*Hyla arborea*) from Italy, presented by Mrs. Kneeshaw; a Beccari's Cassowary (*Casuarus beccarii*) from New Guinea, a Night Heron (*Nycticorax griseus*), two Purple Herons (*Ardea purpurea*), European, two Black-spotted Teguxins (*Tubinambis nigro-punctatus*) from South America, deposited; two Common Sheldrakes (*Tadorna vulpanser*), European, three Mandarin Ducks (*Ex galeculata*) from China, a White-faced Tree Duck (*Dendrocygna viduata*) from Brazil, received in exchange.

OUR ASTRONOMICAL COLUMN.

STRASSBURG OBSERVATORY.—The first contribution to astronomical science of the Kaiserlichen Universitäts-Sternwarte in Strassburg is contained in a handsome volume just published by the Director of the Observatory, Prof. E. Becker. This observatory, it may be remembered, was instituted in the year 1872, Dr. August Winnecke being called upon to fill the post of Professor of Astronomy, and make plans for the arrangements of the buildings and instruments. It is quite worth while recording the fact that almost one of the first acts of Germany after the conclusion of the war, was to arrange for the building of this observatory, showing that, to have an astronomical observatory, which should be a seat "der exacten Wissenschaften," was almost as important as a fortress. No less extraordinary is it that this volume of the "Annalen," just published, should contain the first full description of the buildings and instruments almost fifteen years after they have been set up. We are led to infer from this that the object of the Germans is, in any case, to collect facts, even if they cannot momentarily be published. The buildings were commenced in 1877, and by the summer of the year 1881 work had already begun. In this, the first volume of the "Annalen," Prof. Becker gives a full description of the different buildings and of the various instruments housed in them, illustrating them with eighty excellent photogravure plates. Among these latter are a large refractor of 487 mm. aperture and 7 m. focal length, by Merz, on a mounting by the brothers Repsold; a large comet-seeker with an objective, by Merz, of 162 mm. aperture and a focal length of 1·3 metres; a smaller comet-seeker, a transit instrument by Cauchoix, an orbit-finder (Bahnsucher), an alt-azimuth, and a Repsold meridian circle, having an object-glass of 160 mm. diameter and a focal length of 1·888 metres, by Merz. A thorough and complete investigation of this last-mentioned instrument was undertaken, the results of which are given in full detail. The observations which are here published extend from 1882 March 15 to 1886 September 9, and consist of meridian observations of the sun and chief planets, and of those stars, the positions of which were required for such different objects as comparison stars of comets, angular values of the heliometer scales, longitude determinations. In June 1884 the programme of work was considerably increased, the determination of the positions of 306 Anschlusssterne for the southern zones, and also of eighty-three stars of the southern fundamental catalogue of the Astronomischen Gesellschaft being the chief additions. Following the list of observations are the corrected readings of the meteorological instruments, the temperatures in the basement under the transit circle, and a short account of the climate of Strassburg as gathered from the meteorological observations made from 1873-79.

MARS IN AUGUST LAST.—Prof. V. Cerruli contributes some of his notes on the appearance of the Martian disc, during last August, to *Astr. Nach.*, No. 3384. Of the southern cap, he says, we have no sign. This fact cannot be accounted for solely by reason of perspective; it seems, however, that the southern snows, which diminished very rapidly in June and July, have undergone complete liquefaction. (The southern solstice occurred on July 13.) Ramification of the northern snow took place, according to his opinion, on August 25; on that day he observed for the first time "a flash of lightning more or less intense at the extreme north of Elisium," and this apparition was successfully repeated on the following days. It may be mentioned here that the bright flashes noted by the Lick observers, and others, were seen towards the southern pole in the region known as Chersonesus. With regard to the canals, he says that he was

able to identify a great many. Nilosyrtis appeared, however, very dim and small when compared to the Syrtis Major, which, at this time, is "probably in its maximum state of expansion." Ceberus, on the other hand, was observed to be very straight, wide and dark, and, it was thought, exhibited signs of germination.

"HIMMEL UND ERDE."—The first number of the ninth year of this monthly contains many articles and notes of astronomical interest. Dr. G. Witt, of Berlin, contributes an account of the present state of our knowledge with regard to the planet Saturn, this being the first of two articles on this subject. The question of the origin of the surface markings on our satellite, the moon, is next raised, and the explanation given by Lœwy and Puiseux is brought into discussion. There are, also, two short notes on the rotation period of Venus and a remnant of the Biela comet. The former deals with Perrotin's work, while the latter informs us that Mr. W. E. Hidden, of Newark, U.S.A., is in possession of a piece of the meteorite, weighing 4.090 kilograms, which fell on November 27, 1885, in the neighbourhood of the town of Mazapil. This has been handed over to him by the director (Prof. Bonilla) of the observatory in Zacatecas (Mexico) for a mineralogical investigation. A brief account is given, also, of the new meteorological observatory adjoining the hotel on the top of the Brocken, and a short summary of the new contributions on the measurements of the heights of clouds, by Prof. Kaiser, in Danzig, and Prof. Koppe, in Brunswick.

THE REPORT OF THE ROYAL COMMISSION ON VACCINATION.

THE Report of the Royal Commission on Vaccination is one of the most moderate, and certainly one of the most convincing that has come from any Royal Commission during recent years. The Commissioners have, for seven years, been occupied in making most careful inquiries at all sources as to the efficacy of vaccination in rendering children (and adults) less susceptible to infection by small-pox virus. No trouble has been too great, and no expense has been spared to obtain accurate information as to the truth of statements made by the witnesses who appeared before the Commission; as to the trustworthiness of figures placed in evidence; as to the nature of the disease alleged to be due to vaccination; and as to the exact share that legal compulsion has had in promoting or preventing the vaccination of children. The conclusions at which the Commissioners have arrived are evidently based on the most thorough conviction that the evidence before them, after the careful sifting through which it has gone, is to be thoroughly trusted, whilst their recommendations as regards the alteration in the methods of operation, registration, and legal compulsion certainly appear to be those best calculated to increase the efficiency of vaccination, concerning the value of which they are so thoroughly convinced.

The main considerations of the Commission are arranged under a series of headings, which may first be taken seriatim.

(A) "As to the effect of vaccination in reducing the prevalence of, and mortality from, small-pox." Here they conclude "(1) that it diminishes the liability to be attacked by the disease; (2) that it modifies the character of the disease, and renders it (a) less fatal, and (b) of a milder or less severe type; (3) that the protection it affords against attacks of the disease is greatest during the years immediately succeeding the operation of vaccination. It is impossible to fix with precision the length of this period of highest protection. Though not in all cases the same, if a period is to be fixed, it might, we think, fairly be said to cover in general a period of nine or ten years; (4) that after the lapse of the period of highest protective potency, the efficacy of vaccination to protect against attack rapidly diminishes, but that it is still considerable in the next quinquennium, and probably never altogether ceases; (5) that its power to modify the character of the disease is also greatest in the period in which its power to protect from attack is greatest, but that its power thus to modify the disease does not diminish as rapidly as its protective influence against attacks, and its efficacy during the later periods of life to modify the disease is still very considerable; (6) that re-vaccination restores the protection which lapse of time has diminished, but the evidence shows that this protection again diminishes, and that, to ensure the highest degree

of protection which vaccination can give, the operation should be at intervals repeated; (7) that the beneficial effects of vaccination are most experienced by those in whose case it has been most thorough. We think it may fairly be concluded that where the vaccine matter is inserted in three or four places it is more effectual than when introduced into one or two places only, and that if the vaccination marks are of an area of half a square inch, they indicate a better state of protection than if their area be at all considerably below this."

It is evident from the statistics given that the protection afforded by vaccination against small-pox, though lasting for some time, is gradually lost, so that there comes a period when the protection is very slight indeed. Re-vaccination is naturally the first remedy that suggests itself to meet this difficulty, and from the evidence collected by the Commission from the various epidemics that have occurred, and from the vaccination statistics of the various public services, it is made very apparent that the value of re-vaccination as a preventive of small-pox can scarcely be over-estimated. The proof of this is so conclusive, especially where it is based on the observations made on the ordinary staffs of hospitals, nurses, and the like, who are brought into close contact with small-pox patients, that the re-vaccination statistics alone are sufficient to prove the value of vaccination. The position taken up by Sir Guyer Hunter and Mr. Jonathan Hutchinson in this question in their minority report, appears to us to be the only logical one that could be arrived at, although the limits that should be placed upon compulsion, spoken of elsewhere, would also limit us in regard to re-vaccination. Only these two Commissioners recommend that re-vaccination at the age of twelve should be compulsory, and on the same lines as the initial vaccination; but now that School Boards have their age registration of the children in attendance on their schools, it would surely not be a difficult matter to ensure the vaccination of children of that age, in order that they might be protected through a period during which the susceptibility to the disease, though less than in the earlier years of life, is still considerable; the period, too, during which interference with training for work and with production of work is a very serious matter for the individual, and a matter equally serious for the State.

(B) "As to the objections made to vaccination on the grounds of injurious effects alleged to result therefrom; and the nature and extent of any injurious effects which do, in fact, so result." In regard to this they say "a careful examination of the facts which have been brought under our notice have enabled us to arrive at the conclusion that, although some of the dangers said to attend vaccination are undoubtedly real and not inconsiderable in gross amount, yet when considered in relation to the extent of vaccination work done, they are insignificant. There is reason further to believe that they are diminishing under the better precautions of the present day, and with the addition of the further precautions, which experience suggests, will do so still more in the future." The remedy for this, apparently, is the employment of calf lymph, which would wholly exclude the risks as regards both syphilis and leprosy. The second danger does not concern the British public, whilst the risk of syphilis, although real, is an exceedingly small one, even when humanised lymph is employed, and could probably be wholly avoided by care in the selection of the vaccinator. As regards erysipelas, eczematous eruptions, and vaccinia maligna, calf lymph vaccination appears to have few advantages over arm to arm vaccination. This question is dealt with more fully in the following section.

(C) "As to whether any, and, if so, what means should be adopted for preventing or lessening the ill effects, if any, resulting from vaccination; and whether, and, if so, by what means, vaccination with animal vaccine should be further facilitated as a part of public vaccination." Here again the use of calf lymph is recommended, especially for those who have any doubt as to the source of "arm to arm" lymph. Extension of the age period from three to six months, and the adoption of the legal methods now in vogue in Scotland, are strongly recommended. Special attention is called to the necessity for care and cleanliness, not only during the operation, but also in respect to the instruments used; to the desirability that the operation of vaccination should be done at the child's home, except under special circumstances, to the necessity for postponement of vaccination when erysipelas, scarlet fever, measles, or chicken-pox are prevalent in the neighbourhood of the child's residence, or at the place of vaccination, or on account of the general health of the child, bad surroundings, or other conditions rendering the